



Adaptec 2820SA vs. Promise EX8300: SATA RAID Controller Performance Comparison

Summary

- The Adaptec 2820SA handles more file serving requests faster than the Promise EX8300
- Adaptec RAID is optimized to deliver the lowest response time for transactional processing
- With a dynamic caching policy that reduces controller overhead, Adaptec provides the highest performance for web servers

Adaptec Real-World Performance

Adaptec controllers are designed to perform in the conditions in which you really use them. While other RAID vendors advertise unrealistic workload performance, these measurements don't demonstrate how your RAID controller will hold up under a real-world usage workload.

Adaptec has characterized the most common workloads generated by today's applications and optimized our advanced data protection RAID to give the best overall performance, from the top video streaming throughput in the industry, to the lowest response times for transactional servers.

File Servers

File servers present a special challenge since user requests tend to be scattered across the span of the disks, with distinct hot spots. These hot spots, which typically contain file information structures, open-file updates, page swapping regions, and other frequently accessed data, benefit from effective array caching. The busiest file servers need to service hundreds of requests each second.

A comparison of the Adaptec 2820SA SATA II RAID controller against the Promise EX8300 (see Fig. 1) demonstrates the Adaptec 2820SA's exceptional ability to handle a greater number of user requests, which translates to a lower response times on even your busiest servers.

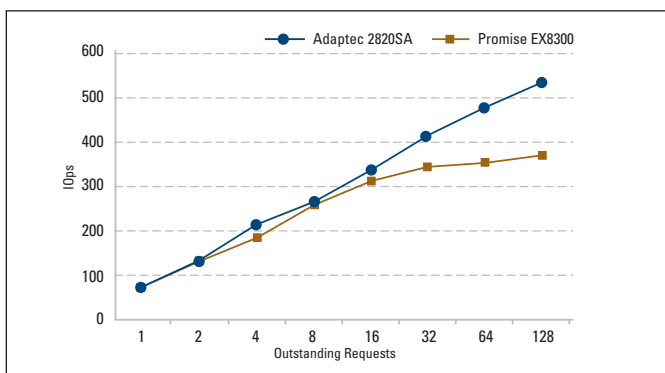


Figure 1: File server performance of the Adaptec 2820SA versus the Promise EX8300 controller on an eight-drive RAID 5.

Web Servers

Today's high-speed world of e-commerce requires storage that can service multiple customer web requests with the lowest possible latency. Both static and dynamic workloads are comprised almost exclusively of read requests with almost entirely random I/O distributions. Studies* have shown that approximately 84% of web server request sizes fall below 16KB, while the remaining 16% is evenly distributed from 32KB to 1MB (consisting primarily of video, audio, and images).

Adaptec controllers are designed with a dynamic caching policy that reduces the controller overhead when dealing with overlapping read and write requests. RAID enhances web server performance by distributing the requests across all the participating drives, significantly increasing performance while also improving availability and reliability (see Fig 2).

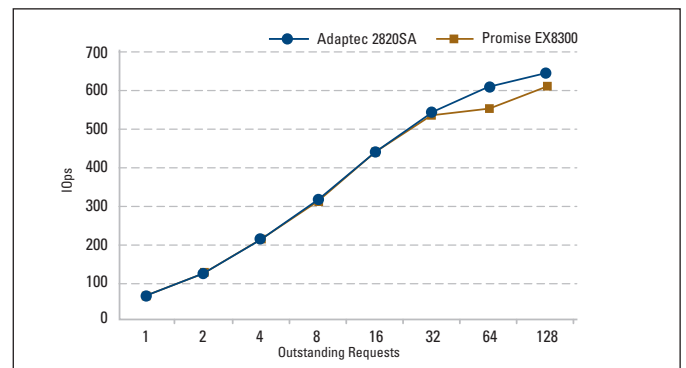


Figure 2: Web server performance of the Adaptec 2820SA versus the Promise EX8300 controller on an eight-drive RAID 5.

* Arlitt, M. F. and Williamson, C. L. Web server workload characterization: the search for invariants. In Proceedings of the 1996 ACM SIGMETRICS international Conference on Measurement and Modeling of Computer System).

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Online Transaction Processing (OLTP) Server

Today's digital economy has become more reliant on storage systems for archiving online transactions and vital records — such as from database applications including decision support/data warehousing, web-based e-commerce, and business reporting.

Because transaction servers are highly sensitive to response times, the ability to preserve data integrity by maintaining in-order execution of commands for a mixed read/write workload, is key (see Fig. 3).

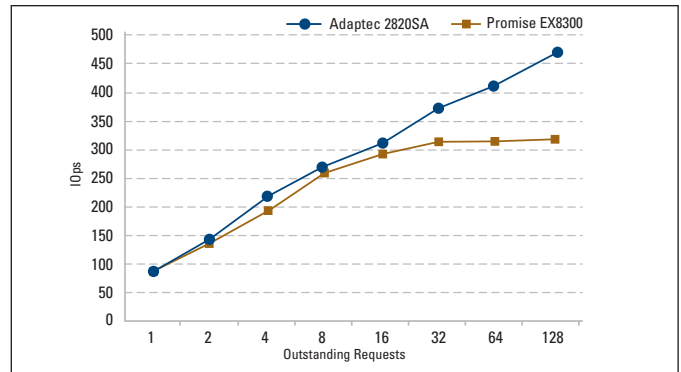


Figure 3: 4KB OLTP performance of the Adaptec 2820SA versus the Promise EX8300 controller on an eight-drive RAID 5.

Test Environment

The following test environment was used:

- CPU: Dual Intel P4 Xeon 3.60 GHz (hyperthreading enabled)
- Motherboard: Supermicro X6DH8-G2
- Memory: 4GB PC2-3200 Registered ECC
- HDD: Eight Maxtor Diamond Max 10 (disk write cache enabled)
- OS: Windows 2003 Enterprise Server SP1
 - Testing Utility: IOMeter version 2005.30.07

- Adaptec RAID adapter information:
 - Adaptec Serial ATA II RAID 2820SA with 128 MB cache; Device driver: Release Windows driver version 5.1.8360; Firmware 8832
 - Eight-drive RAID 5, 256KB stripe (default setting), array caching enabled, full initialization
- Promise RAID adapter information
 - SuperTrak EX8300 with 128MB cache; Device driver 2.9.0.2; Firmware 1.0.0.33
 - Eight-drive RAID 5, 64KB stripe (default setting), write back, protection; full initialization

Comparison Matrix

	Adaptec Serial ATA II RAID 2820A	Promise SuperTrak EX8300
General Description	8-port SATA II RAID controller (PCI-X, 133MHz)	8-port SATA II RAID controller (PCI-X, 133MHz)
Processor	Adaptec AIC-8210	Intel 80331
Array Types Supported	RAID 0, 1, 1E, 5, 5EE, 6, 10, 50, 60	RAID 0, 1, 5, 10, 50
Highlights	Copyback Hot Spare, Optional Battery Module, Online Capacity Expansion (OCE), RAID Level Migration, Optimized Disk Utilization	Online Capacity Expansion (OCE), RAID level migration, Optional Battery backup support
Form Factor	3.1"H x 6.6"L	2.5"H x 6.6"L



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